Proposal # 2001-K219 (office use only)

PSP Cover Sheet

Proposal Title: Lower Calaveras River chinook salmon and steelhead life history limiting factors assessment.

Applicant Name: Fishery Foundation of California
Contact Name: Patricia Duran
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Email:

Amount of funding requested: $314,704

Cost share partners Y e s X No
Identify partners and amount contributed by each:

Indicate the Topic for which you are applying (Check only one box).

Natural Flow Regimes	Beyond the Riparian Comdor
Nonnative Invasive Species	Local Watershed Stewardship
Channel Dynamics/Sediment Transport	Environmental Education
Flood Management	Special Status Species Surveys and Studies
Shallow Water Tidal/Marsh Habitat	**X** Fishery Monitoring Assessment and Research
Contaminants	Fish Screens

What County or Counties is the project located in? Calaveras County and San Joaquin County.

What CALFED ecozone is the project located in? Eastside Delta Tributaries Ecological Management Zone.

Indicate the type of applicant (check one box only):

State agency	Federal agency
Public/Non-profit joint venture	X Non-Profit
Local government/district	Tribes
University	Private party
Other:	

Indicate the primary species which the proposal addresses (Check **all** that apply):

San Joaquin and East-side Delta tributaries fall-run chinook salmon	
Winter-run chinook salmon	Spring-run chinook salmon
X Late-fall run chinook salmon	**X** Fall-run chinook salmon
Delta Smelt	Longfin smelt
Splittail	**X** Steelhead trout
Green sturgeon	Striped bass
White sturgeon	All chinook species
Waterfowl and shorebids	All anadromous salmonids
Migratory birds	American shad
Other listed T/E species:	

Indicate the type of project (check only one box):

X Research/monitoring	Watershed planning
Pilot/demo project	Education
Full scale implementation	

Is this a next-phase of an ongoing project? **Yes** — No X
Have you received CALFED funding before? Yes X No —
If yes, list project title and CALFED number:
Fishery Foundation of California

Cosumnes Riv. - Salmonid Barrier Improvement, CALFED project #98-B1009

Stillwater Sciences (Sub-Contractor)

Merced River Corridor Restoration Plan, CALFED project #. 98E-09; Merced River Corridor Restoration Project-Phase III: Plan Development and Conceptual Designs, No CALFED project number assigned; Project to begin FY 2000; A Mechanistic Approach to Riparian Restoration in the San Joaquin Basin, CALFED # 99-B152; Project to begin FY 2000

Have you received funding **from** CVPIA before **Yes** ___ **No** X*
If yes, list CVPIA program providing funding, project title and **CVPIA** number:
Fishery Foundation of California

Juvenile salmon distribution in the Stanislaus River: Cooperative Agreement #114200J033-USFWS

Stillwater Sciences (Sub-Contractors)

Merced River: Raslaff Project, CVPIA 11332-9-M079; Stanislaus River: 2 Mile **Bar,** CVPIA 11332-9-MO80; Stanislaus River: Smolt Survival, CVPIA 11332-0-Mo09.

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application of behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion on the PSP (Section 2.4) and waives any and all rights of privacy and confidentiality of the proposal on behalf of the applicant to the extent **as** provided in the Section.

PATRICIA DURAN
Printed name of applicant

Signature of applicant

B. Executive Summary

Project Title:	Calaveras River chinook salmon and steelhead population abundance and limiting factors analysis
Applicant:	Fishery Foundation of California
Address:	P.O. **Box** 271114 Concord CA 94527-1114
Phone:	(925) 944-9115
FAX:	(925) 944-3514
Subcontractor:	Stillwater Sciences/ 2532 Durant Ave/ Berkeley CA 94704

Project Description and Primary Biological/ Ecological Objectives:

The goal of this project is to provide information that can be used in the preliminary development of a technically sound and implementable, consensus-based plan to restore self-sustaining populations of chinook salmon and steelhead to the Calaveras River. Physical factors known to occur in the river, such as reduced flows, juvenile entrainment by water diversion projects, and habitat destruction by in-river gravel mining, can negatively impact life history stages of chinook salmon and steelhead. However, little is known about how human-induced physical changes in the Calaveras River might impact the population dynamics of chinook salmon and steelhead. This study would aid the consensus-building process by providing scientifically defensible, quantitative information on the relationship between manageable physical factors and the dynamics of chinook salmon and steelhead populations, and would give stakeholders a foundation for informed decision-making.

Approach, Tasks, and Schedule: The project team will coordinate with the Calaveras River Steering Committee and the Calaveras County Water District in an iterative process to formulate final hypotheses and create a study design that is biologically relevant to the system and reflective of the management options of stakeholders. The study design consists of a first-year reconnaissance-level evaluation of existing information on chinook salmon and steelhead in the Calaveras River and physical characteristics of the ecosystem such as hydrograph components, temperature, fish habitat, and water diversions. During the second year, focused field studies and population modeling will refine the understanding developed during the first year reconnaissance phase.

Budget Costs and Third Party Impacts: The cost of the two-year project would be $314,704. All aspects of the project will be closely coordinated with stakeholders to identify and avoid potential third-party impacts.

Applicant Qualifications: The Fisheries Foundation of California has worked on a wide range of fisheries restoration projects throughout California. Stillwater Sciences has over 10 years of experience performing analogous work on the Tuolumne River, CA.

Data Evaluation: Intermediate and final data evaluation and development of subsequent hypotheses will occur with the input of coordination groups and agencies.

Local Support/ Coordination with Other Programs/ Compatibility with CALFED Objectives: This project will provide baseline information and restoration strategies to address ERPP and CVPIA objectives related to restoring habitat requirements of chinook salmon and steelhead. The project team has coordinated closely with the Calaveras River Steering Committee and the Calaveras County Water District to develop a study design that will provide unbiased quantitative information upon which consensus-based restoration actions can be developed.

C. Project Description

1. Statement of Problem

a. ***Problem:***

Fall-run and winter-run chinook salmon and steelhead have been known to return irregularly to the Calaveras River. In recent years, chinook salmon and steelhead have been observed in the Calaveras River when suitable streamflows have occurred. For example, in the fall of 1995, "several hundred" fall run chinook were observed below Bellota Weir in Mormon Slough (CDFG unpublished data, as cited in Yoshiyama et al. 1996). In general, however, runs have been low (CALFED 1999, **AFRP** 1995) and are likely not self-sustaining. Reduced flows, juvenile entrainment by water diversion projects, and habitat destruction by in-river gravel mining are thought to limit chinook salmon and steelhead populations (CALFED 1999, AFRP 1995). However, is insufficient information to understand the role of these factors and other potential sources of mortality in controlling chinook salmon and steelhead population dynamics.

Flow in the Calaveras River is regulated by New Hogan Dam, which is located 34 miles upstream of the Delta and is operated for flood control and municipal and agricultural water supply. Downstream of New Hogan Dam, Calaveras County Water District customers divert flow at nine small diversion pumps, and Stockton East Water District diverts flow through a system of weirs and diversion channels. Such flow regulation and diversion, along with gravel mining and other activities in the Calaveras River, have affected aquatic habitat quality and extent and may constrain critical life history stages of chinook salmon and steelhead.

Currently, there are three migration routes that adult chinook salmon and steelhead may use to access the mainstem Calaveras River upstream of Bellota Weir: (1) the historical Calaveras River channel below Bellota Weir, (2) Mormon Slough, and *(3)* Mormon Slough via the Stockton Diverting Canal (Figure 1). However, numerous irrigation dams along these migration routes create partial or complete migration barriers to chinook salmon (CALFED 1999) and, therefore, limit salmon access to habitat in the mainstem Calaveras River between Bellota Weir and New Hogan Dam. The majority of chinook salmon migrate through the Stockton Diverting Canal and Mormon Slough to access the mainstem Calaveras River because there are generally higher flows in these diversion channels than in the historical Calaveras River channel.

In November 1999, Stillwater Sciences conducted a baseline study for the New Hogan Lake Conservancy and the Anadromous Fish Restoration Program (AFRP) (Stillwater Sciences 2000) to assess the condition of chinook salmon spawning habitat in the 1.5-mile reach of the Calaveras River immediately downstream of New Hogan Dam. This investigation concluded that the surveyed reach provided limited suitable habitat for chinook salmon spawning, and survival of eggs and alevins from redds in these potential spawning areas was predicted to be low. Due to low population numbers, however, spawning habitat availability was not considered to be limiting. Based on these findings, Stillwater Sciences recommended a reconnaissance-level evaluation of chinook salmon habitat conditions and population dynamics throughout the river. The present study design reflects this need and has expanded the scope to include steelhead, which were documented in the Calaveras River earlier this year (Dennis Smith, NMFS, personal communication).

The proposed study would be coordinated with the Calaveras River Steering Committee (CRSC), which is actively working to broaden its base and serve as a forum for watershed coordination. The CRSC would guide an adaptive, hypothesis-driven, research approach from which an objective understanding of the system can be developed and incorporated into a consensus-based restoration process. Given that water in the Calaveras River is highly allocated, and valued for uses outside the river channel (**AFRP** 1995), it is of paramount importance that the relationship between flow and the population dynamics of chinook salmon and steelhead be well-understood (CDFG 1993, Hunter 1991, USFWS 1993).

The proposed study would refine the understanding of how water management, in conjunction with other factors, limits the ability of chinook salmon and steelhead to establish self-sustaining populations in the Calaveras River. Other potential sources of mortality to be investigated include past gravel extraction in

elevating water temperatures and providing habitat for predators of juveniles, barriers to upstream migration, and spawning and rearing habitat quality and quantity. In view of the AFRP goal of doubling natural salmonid populations, this study would provide critical stakeholder organization and scientific information necessary to provide a foundation upon which to design and implement adaptive management of the Calaveras River and the restoration of chinook salmon and steelhead.

b. Conceptual Model

While this proposal is focused on chinook salmon and steelhead, it must also address the role of ecosystem processes such as sediment transport and riparian vegetation dynamics in the creation and maintenance of suitable salmonid habitat. Our approach to river restoration is based on restoring or reinitiating geomorphic and ecological processes (within certain constraints) to achieve the restoration goal of self-sustaining target populations. Development of conceptual models of key ecosystem linkages is the foundation of our approach to ecosystem restoration and management. Our primary objective is to link land use activities (including water uses) with resultant effects on aquatic organisms (illustrated in Figure 2). To accomplish this, we must first link the effects of land use activities to changes in physical processes and channel/floodplain geomorphic conditions, which are in turn linked to changes in habitat conditions, leading ultimately to responses of aquatic biota.

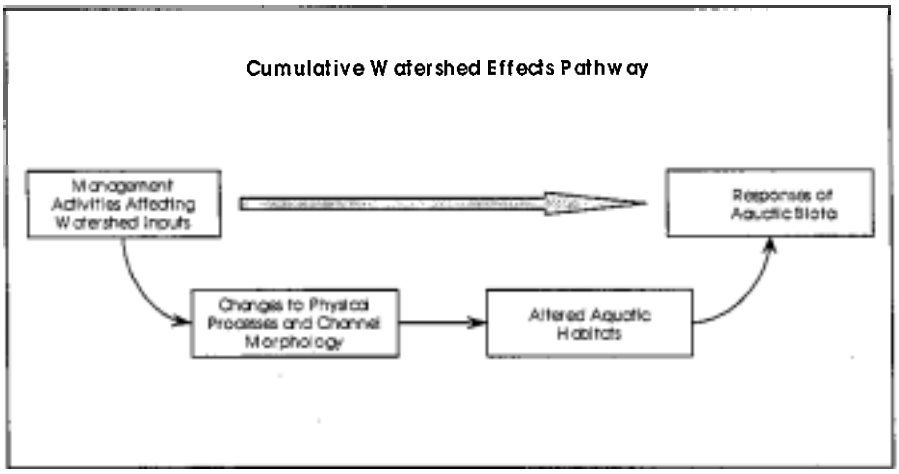

Figure 2. A simple conceptual model of the ecosystem linkages (or pathways) used to assess the cumulative watershed effects caused by management activities.

A somewhat more detailed, but still very simplified diagram of the conceptual model underlying our approach is shown in Figure **3.** In this model, the magnitude, timing, and spatial distribution of watershed inputs (e.g., water, sediment, and nutrients) is influenced by natural and anthropogenic disturbance. Alterations in watershed inputs alter important geomorphic processes (e.g., sediment transport and channel migration). These processes construct geomorphic attributes that determine habitat structure, complexity, and connectivity. Species abundance and population dynamics, community composition, and trophic structure may be directly affected by these habitat attributes.

Our goal is to integrate the insight and expertise of physical and biological scientists to establish quantitative ecosystem linkages. To be more fruitful, the linkage assessments, such as flow-temperature or sediment-habitat, should not be done separately but as one integrated analysis, which we refer to as our reference model approach, which seems to be completely consistent with the ecosystem approach envisioned by CALFED.

For the reference model approach, we first establish how processes work under reference or historical conditions and then analyze how human activities have altered these processes, which in turn have altered habitat conditions. We next assess how changes in habitat quality and quantity affect density-dependent and density-independent survival at each life history stage and then use population response models to determine the population-level effects for each key species (in this case, chinook salmon and steelhead). Within this

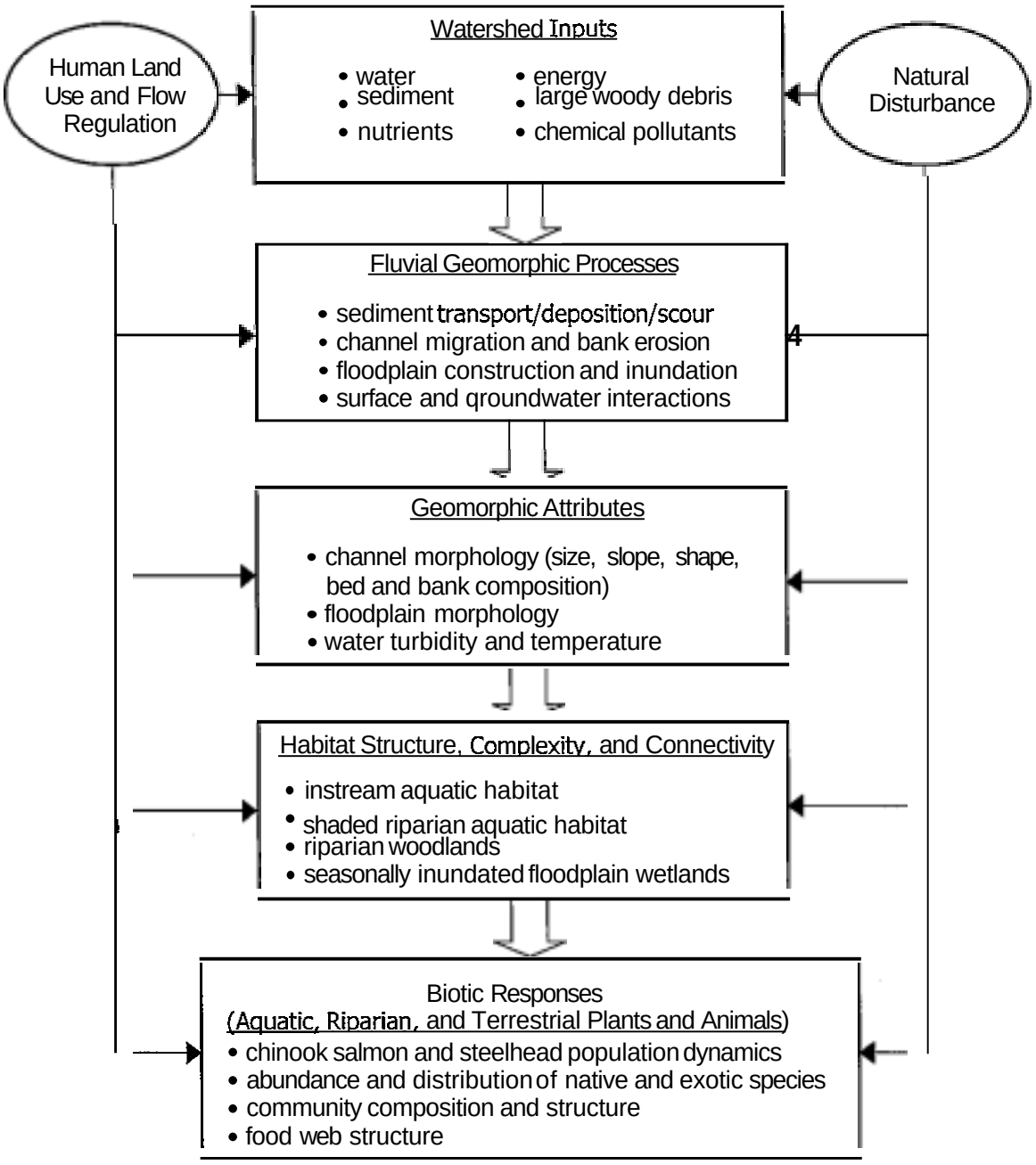

Figure 3. A simplified conceptual model of the physical and ecological linkages used in developing plans for restoration of healthy riverine ecosystems and naturally reproducing and self-sustaining salmon populations.

framework, we are able to employ 'gaming' or scenario-based techniques that allow exploration of various alternative restoration or management strategies. The reference model also allows us to determine the combined effects of different management actions, such as simultaneously altering flow and channel structure, on populations to determine the most cost-effective way of achieving the desired goals.

Mortality at every life history stage affects population dynamics. It is only by taking a holistic approach that the relative effects of different sources of mortality can be understood. It is within this context that the effects of gravel extraction and water diversion will be examined. Table **1** shows some of the life-stage specific sources of mortality that may be important in the Calaveras River.

Life Stages	Life History Activity	Potential Limiting Factors	
		Density-independent	Density-dependant
Adult	In-migration	• Elevated temperature • Barriers to migration • Reduced ability to track home river due to low flow conditions	• Quantity of holding habitat • Angling
	Spawning	• Spawning gravel quality • Redd dewatering due to flow fluctuation	• Spawning habitat quantity (redd superimposition)
Egg and Alevin	Incubation	• Elevated temperature • Low substrate permeability	• Disease/parasites/predation
Fry and Juvenile	Rearing	• Elevated temperature • Stranding due to flow fluctuation	• Disease/ parasites/predation • Food supply
Smolt	Out-migration	• Elevated temperature • Entrainment/barriers to migration • Stranding due to flow fluctuation	• Disease/ parasites/predation

Table 1: Concept model indicating the potential limiting factors for different life history stages of chinook salmon and steelhead.

c. *Hypotheses Being Tested:*

Due to the adaptive nature of the proposed study, the final hypotheses to be tested will depend on stakeholder priorities and on information developed in the reconnaissance portion of the study (Task ***3)***. However, the over-arching hypothesis that motivates this proposal is the widely held belief that the human impacts of reduced flows and diversion structures as well as gravel extraction limit chinook salmon and steelhead population dynamics in the Calaveras River (AFRP 1991, ERPP 1999). This hypothesis will be tested by examining the population-level implications of these and other impacts

Seven preliminary hypotheses that will dnve the reconnaissance portion of this study are:

Habitat Alteration: (1) Impoundments and gravel extraction have reduced coarse gravel recruitment and degraded spawning habitat; and (2) flow reduction has resulted in less suitable habitat for all life history stages of salmon.

Barriers to Migration: (1) In-channel diversion structures act as barriers to adult upstream migration; (2) flow changes make diversion structures more difficult for fish to pass; and ***(3)*** water diversions result in entrainment and mortality of juvenile salmonids.

Elevated Water Temperature: (1) Impoundments and gravel extraction have caused elevated water temperatures that are favorable to bass, which prey on juvenile salmonids; and (2) flow reduction has elevated water temperatures which reduce salmonid survival and reproductive success.

Once a reconnaissance-level study is completed, more detailed hypotheses will be developed to guide later tasks.

d. Adaptive Management:

In the Calaveras River ecosystem, the relationship between human activities and salmonid populations is not well understood. Given that the potential costs of restoring salmon and steelhead populations are potentially high, an adaptive management approach is imperative. Such an approach acknowledges our incomplete understanding of cause-and-effect relationships among management actions, ecological processes and resource conditions, and the uncertainty in predictive models of ecosystem function and behavior (Holling 1978, Walters 1986, Lee 1993). This strategy treats restoration and management goals as hypotheses that can be tested through monitoring studies in which specific expectations and desired goals are compared with quantitative measures of results (Christensen et al. 1996). Walters (1997) stresses the importance of (1) integrating existing knowledge into models that predict the effects of different management alternatives and (2) designing management experiments to test model predictions to speed the learning process. It is essential to this process that a direct feedback loop exist between researchers and stakeholders, so that operational and policy decisions can be modified in light of new scientific information. The adaptive management process balances the need for projects to be economically and socially viable on the one hand, with the demands for hypothesis-driven research and quickly implemented resource protection strategies on the other.

Our conceptual approach to the restoration planning effort for chinook salmon and steelhead in the Calaveras River ecosystem is based on an iterative process of hypothesis development and testing, which will provide the foundation for an adaptive management approach. Due to the uncertainty regarding the relationship between management actions and chinook salmon and steelhead population dynamics, a flexible approach is required. To accomplish this, we will conduct pilot, or reconnaissance, studies to synthesize existing knowledge of the Calaveras River and will work with the CRSC and funding agencies to develop conceptual models and a targeted research plan that is relevant to the management constraints particular to the Calaveras River system. As our understanding of the important factors in the system becomes more refined, more targeted research approaches will be used to address problems. The result of this adaptive process will be a set of conclusions about the types of management actions that will help restore the health of chinook salmon and steelhead populations in the Calaveras River system.

e. Educational Objectives:

This project will be coordinated with the CRSC and other stakeholders in the watershed to determine the nature of limiting factors on chinook salmon and steelhead populations. The ultimate goal of the project is to provide stakeholders with objective information upon which to define water use practices that improve of chinook salmon and steelhead production in the Calaveras River.

2. Proposed Scope **of** Work

a. Location/ Geographic Boundaries of Project:

This work would occur in the Calaveras River between New Hogan Dam and the Delta in Calaveras and San Joaquin counties (Figure 1). Two major imgation channels that serve as alternate migration routes for chinook salmon and steelhead will be included as well. This project area is within CALFED's Calaveras River Ecological Management Unit, which lies within the Eastside Delta Tributaries Ecological Management Zone. The centroid is X = 668872.751, Y = 4212427.489 (projection = UTM, zone = 10, datum = nad27, units = meters).

b. Approach:

YEAR 1

Task **1:** Stakeholder coordination/ Steering Committee Development

The Fishery Foundation of California and Stillwater Sciences will work with the CRSC, a broad-based group that seeks to coordinate stakeholder activity on the Calaveras River. The CRSC consists of the New Hogan

Lake Conservancy, Woodbridge Rivers Company, Delta Flyfishers, and the Foothill Conservancy. To achieve full representation of stakeholder perspectives, the CRSC is attempting to bring other stakeholders, particularly the Calaveras County Water District (CCWD) and the Stockton East Water District (SEWD), into the process as well. This will ensure efficient transfer of information between all parties, prevent redundant effort by researchers, and eliminate unintended third-party damages as a result of restoration decisions.

Task 2: Quality Assurance Program Plan

A Quality Assurance Program Plan (QAPP) and Monitoring Plan (one document) will be prepared to describe the research objectives, hypotheses, parameters, and analytical techniques to be used in completing subsequent tasks in this work plan, as well as the data quality and assurance measures that will be employed. General data quality assurance and control methods are described in Section 2d of this proposal. A draft QAPP/Monitoring Plan will be submitted to CALFED for comment and approval before data collection will begin.

Task 3: Reconnaissance Survey

An initial reconnaissance survey will form the backbone of the rest of the study. Rapid and thorough evaluations of existing information and focused data collection efforts will provide the required insight about chinook salmon and steelhead life histories and about the function of the Calaveras River system as a whole. The results of this reconnaissance survey will provide the background for the hypotheses to be tested throughout the remainder of the project.

3.1: Calaveras River Steelhead and Chinook Salmon Life History Description

Review available literature and survey data and interview local experts to develop a description of the timing and spatial patterns of chinook salmon and steelhead migration, spawning activity and juvenile and smolt outmigration, and to describe historical and current population abundance, and important habitat areas.

3.2: Hydrograph Components Analysis

Assess the timing, magnitude, and duration of hydrograph components under regulated and unimpaired conditions to provide quantitative assessment of the effects of regulation on the river system. This will yield an objective description of the effects of New Hogan Dam and downstream diversions on Calaveras River hydrology, and potential effects on habitat conditions. Data sources for this analysis include:

Gauge Data

- USACE gauge, New Hogan Dam (period of record 1966 to present)
- USACE gauge, Mormon Slough at Bellota (period of record 1997 to present)
- USGS gauge, Jenny Lind, gauge number 11309500 (period of record 1908 to 966)
- USGS gauge, Calaveras Near Stockton, gauge number 11310900 (period of record 1944 to 1950)

Unimpaired Flow Calculations

Calculation of daily, unimpaired flow at New Hogan Dam developed by the Army Corps of Engineers for the period 1966 to present.

3.3: Temperature Data Evaluation

Compile and analyze available water temperature data for the Calaveras River and compare temperatures with to chinook salmon and steelhead thresholds and tolerances for various life history stages.

3.4: Steelhead and Chinook Salmon Habitat Assessment

Using aerial photographs taken by California Department of Water Resources in November 1998 (1:2,000 scale), develop coarse-level habitat maps of the Calaveras River. Identify potentially important habitat areas for chinook salmon and steelhead spawning and rearing.

3.5: Water Diversion Infrastructure Description

Describe and map existing water diversion infrastructure in the Calaveras River. Describe the characteristics of structures and their operation with respect to location on the river and times of year in which they are in use. Identify potential barriers to adult chinook salmon and steelhead upstream migration and possible points of juvenile entrainment.

3.6: Reconnaissance-level Field Surveys

Validate information gathered in Subtasks 3.1—3.5 and explore and refine hypotheses through focused field surveys and a helicopter survey of the entire extent of the study area from the Delta to New Hogan Dam.

3.7: Report of Reconnaissance Findings

Report findings from subtasks **3.1** – 3.6 for steering committee review and hypothesis refinement in preparation for subsequent tasks.

Task 4: Fish Community Assessment

Assess fish community species composition and distribution and refine the understanding of temporal and spatial patterns of chinook salmon and steelhead use in the river.

4.1 Conduct snorkel and seine surveys on a biweekly basis from January through May to determinejuvenile presence and activity at locations throughout the Calaveras River.

4.2 Monitor a rotary screw trap (January through May) to assess the timing of juvenile outmigration and juvenile outmigrant abundance (the trap will be provided on loan by the **USFWS).**

Task 5: Temperature Monitoring

Based on the reconnaissance-level analysis of temperature data, (Subtask 3.3) deploy and monitor thermographs at six to eight appropriate locations in the river from New Hogan Dam to the Delta.

Task 6: Barrier and Entrainment Point Evaluation

Select known and possible barriers to migration and conduct intensive hydraulic assessment to determine the likelihood that a structure may act as a barrier, and quantify the flow conditions under which it is likely to do so.

Task 7: Preliminary Population Modeling and First Annual Report

Use population models to explore links between factors studied in previous tasks and possible population-level effects on chinook salmon and steelhead. Determine which ecosystem factors are most likely to limit fish populations and develop study priorities for the second year. Produce first annual report for presentation to CRSC and funding agency.

YEAR 2

Task 8: Mechanistic Field Research

Develop targeted studies to assess factors identified in Task 7 as likely to limit population abundance. Until Tasks 1-7 have been completed, it is not possible to identify which studies will be conducted. Some examples of factors that may be evaluated are listed in Appendix **A.**

Task 9 Data Synthesis (Modeling)

Develop a refined model of limiting factors and estimate total carrying capacity of habitat, given the range of possible restoration actions.

Task 10: Identification of Actions to Increase Chinook Salmon and Steelhead Abundance

Synthesize information collected and analyses conducted in Tasks **3–9** above. Based on this synthesis, identify a range of actions to increase chinook salmon and steelhead abundance in the Calaveras River. Produce one draft and one final report describing the methods, results, and conclusions used in and produced in Tasks **2–9**.

c. Monitoring and Assessment Plan:

The proposed project is essentially a monitoring and assessment plan to determine the impacts of ongoing environmental manipulations and identify future restoration actions. This project will generate information designed to lead to restoration actions, in which case a monitoring and assessment plan would be needed.

d. Data Handling and Storage:

In the reconnaissance phase of this study, Stillwater Sciences will gather publicly accessible data. When new data sets are encountered, these data will be integrated into the existing data whenever possible given formatting issues and budgetary constraints. Electronic data will be stored in database or similar format, and the Project Team will retain all data at Stillwater Sciences' Berkeley office. Stillwater Sciences will submit all data required for public record to the appropriate party and shall retain copies of all project files, including data, metadata, maps, and other information for a period of five years upon completion of the work. Where field data collection is necessary, the Project Team will use standard quality assurance and control (QA/QC) methods in designing sampling protocols and in obtaining, recording, and analyzing data. All field data will be recorded on standard data sheets and in field books. Field crews will review current data and notes collected at the end of each day for completeness and clarity, and will photocopy all data upon return to the office. The original field books and data sheets as well as one set of photocopies will be stored at Stillwater Sciences office.

e. Expected Products/ Outcomes:

- Progress updates presented to stakeholder meetings
- First year report
- Final report and recommendations of management priorities

*f. **Work** Schedule:*

		2000			2001												2002									
TASK		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct
YEAR 1																										
1	Stakeholder Coordination (5 meetings)																									
2	Quality Assurance Program Plan																									
3	Reconnaissance Survey																									
3.1	*Salmonid Life History Description*																									
3.2	*Hydrologic Components Analysis*																									
3.3	*Temperature Data Evaluation*																									
3.4	*Aerial Photo Habitat Mapping*																									
3.5	*Describe Water Diversions/ Infrastructure*																									
3.6	*Conduct Reconnaissance Field Studies*																									
3.7	*Produce Report of Initial Findings*										X															
4	Fish Community Assessment																									
4.1	*biweekly seining/ snorkeling - 5 trips*																									
4.2	*rotary screw trapping*																									
5	Temperature Monitoring																									
6	Barrier/ Entrainment-Point Evaluations																									
7	Preliminary Population Modeling and First Annual Report												X													
YEAR 2																										
8	Mechanistic Research																									
9	Data Synthesis (Modeling)																									
10	Define Restoration Goals and Objectives + final report																									X

g. Feasibility:

The approach and methods proposed have been shown to be effective and feasible in the Tuolumne River (Ligon 1998). The Tuolumne River studies, successfully conducted by Stillwater Sciences staff over a 10-year period, provide a tested model for the Calaveras River (see literature cited in the Tuolumne River studies

section). These studies provide the foundation for the settlement agreement reached on the Tuolumne River between imgation districts, state and federal agencies, and environmental groups.

The Calaveras River is regulated in the reaches proposed for study and, therefore, unanticipated flooding is not a risk.

While some aspects of the proposed work depend upon completion of the reconnaissance task, the completion of the reconnaissance work will not be affected by unforeseen factors, as it will be conducted using publicly available information and in publicly accessible locations. Additionally, the scheduling of all required work is in full control of the contractors on the project and sufficient flexibility to adjust schedules of tasks has been allowed in the project design to assure completion of work within the broader timeframe. Where access to privately owned channel banks or other land is needed, the project design is sufficiently flexible to allow the contractors to select from a variety of sites. Permits for trapping and handling fish shall be obtained from CDFG. In the event that this project is selected for funding, access agreements shall be provided within the required time frame.

C. Applicability to CalFed ERP Goals and Implementation Plan, and CVPIA Priorities

1. ERP Goals and CVPIA Priorities

ERP Goals

CALFED's ERP Plan identifies the Calaveras River Ecological Unit and other components of the Eastside Delta Tributaries Ecological Management Zone as important fish habitat (classified as Freshwater Fish Habitat and Essential Fish Habitat). The specific vision for chinook salmon and steelhead restoration within the Calaveras River Ecological Unit includes: **(1)** improving streamflows for passage, spawning, rearing and emigration; *(2)* improving gravel recruitment; (3) ensuring appropriate Water temps for egg incubation and rearing; (4) increasing riparian and riverine aquatic habitat; and (5) reducing or eliminating unscreened diversions.

CVPIA Priorities

The AFRP working paper (AFRP 1995) identifies the following factors that need to be addressed on the Calaveras River in view of their general goal of doubling natural populations of anadromous fish: (1) instream flows; (2) water temperature; (3) migration barriers; (4) entrainment at diversions. The goals of this project are consistent with the goals of both CALFED's ERPP and the AFXP. The proposed study would develop a better understanding of factors that limit the abundance of anadromous fish in the Calaveras River. **A** clear, scientifically founded understanding of the relationship between human impacts to the system and fish population dynamics is crucial in view of the substantial negotiations that will be required to restore chinook and steelhead production in the Calaveras River.

Insufficient flows: This study will document the impacts of flow conditions and refine the understanding of the relationship between flow magnitude, and salmonid reproductive success and population dynamics.

Gravel Recruitment: This study builds on a previous study conducted by Stillwater Sciences that indicated that potential spawning habitat did not appear to be limiting in the 1.5-mile reach below New Hogan Dam. While the current study has expanded to focus on other possible limiting factors to anadromous fish reproductive success, the study will continue to evaluate the possibility that chinook salmon and steelhead are limited by spawning habitat and may benefit from enhanced gravel recruitment.

Migration Barriers: Structures impeding adult migration are thought to be a major cause of reproductive failure on the Calaveras River. The Bellota Weir and various check dams are known to block upstream migration of adults under certain flow conditions. This study will document the presence of potential barriers to migration and assess the ability of adult salmonids to pass these barriers changes with changes in flows.

Water Temperature: Low flows may also result in elevation of water temperatures above the preferred range of salmon and steelhead, and elevated temperatures may result in exhaustion and reduced fecundity or

death of adult fish attempting upstream migration. Water temperatures exceeding the physiological limits of chinook have been documented in the Calaveras (AFRP 1995) and sub-lethal temperature elevations may result in reduced incubation and juvenile-rearing success, and in lower overall fish production for the Calaveras River. This study would document the relationship between flows and temperatures throughout the river.

Diversions: Another major cause of reduced productivity in a highly diverted river, such as the Calaveras, is juvenile mortality due to entrainment in water diversions. In collaboration with other groups addressing the issue of unscreened diversions, this study would document screening needs of existent diversions and address the relationship between diversion activity and juvenile mortality.

2. Relationship to Other Ecosystem Restoration Projects

While there has been relatively little work done on the Calaveras River to address the critical issues mentioned above, in 1999 the Anadromous Fish Restoration Program funded Stillwater Sciences to conduct a pilot study of chinook salmon habitat in the 1.5 miles of the river below New Hogan Dam. The recommendations of that study have led directly to this proposal.

In addition, Stillwater Sciences has coordinated with the Calaveras County Water District (CCWD) and the Stockton East Water District (SEWD) with respect to their projects on the Calaveras River that would complement the work in this proposal:

1. The CCWD, in conjunction with the SEWD, is submitting a CALFED proposal for funding to install fish screens and perform monitoring.
2. The CCWO and the SEWD are proceeding with watershed management effort. They are applying for a State Water Resources Control Board grant and the emphasis of the project would be on watershed management for drinking water quality. While the emphasis of this project is drinking water quality, the removal of contaminants from water would benefit fish. The water districts are working with Tetra Tech to develop this proposal.

The SEWD is also proposing a project to install fish screens at the Bellota diversion.

3. Requests for Next-Phase Funding

This project is not an extension of a CALFED funded project.

4. Previous Recipients of CALFED or CVPIA Funding

Fishery Foundation of California

- CALFED: Cosumnes River Salmonid Barrier Improvement, CALFED project #98-B1009
- CVPIA: Juvenile salmon distribution in the Stanislaus River: Cooperative Agreement #114200J033-USFWS.

Stillwater Sciences (Sub-Contractor)

- CALFED: Merced River Corridor Restoration Plan Phase 11, project # 98E-09; Merced River Corridor Restoration Project-Phase III: Plan Development and Conceptual Designs, project number assigned, project to begin FY 2000; A Mechanistic Approach to Riparian Restoration in the San Joaquin Basin, project #: 99-B152, project to begin FY 2000.
- CVPIA: Merced River: Raslaff Project, CVPIA 11332-9-M079; Stanislaus River: 2 Mile Bar, CVPIA 11332-9-M080; Stanislaus River: Smolt Survival, CVPIA 11332-0-Mo09.

5. System-wide Ecosystem Benefits

This project will provide information that would facilitate restoration of chinook salmon and steelhead populations in the Calaveras River. Any restoration actions will result in general improvement of the ecosystem which will likely benefit other native species.

D. Qualifications

Fishery Foundation **of** California

Established in 1985, the Fishery Foundation of California is a charitable, non-profit corporation based in Concord CA that is dedicated to increasing California's fishery resources. The Foundation has been funded by a number of state agencies, corporations, foundations, and individuals to carry out fisheries research and restoration efforts. The Foundation undertakes a wide array of salmon restoration and research projects that include: restoring and enhancing several tributaries of the Eel River in Northern California to improve habitat for salmon and steelhead; addressing fish barriers by removal and enhancement on a portion of the Cosumnes River in the Sacramento Valley (under CALFED funding); and managing 420 acres in the Suisun Marsh to test innovative management strategies to improve habitat and nursery areas for salmon. The Executive Director is Patricia Duran; Project Manager is Trevor Kennedy.

Fishery Foundation **of** California **Staff**

Trevor Kennedy has a B.S. in fisheries from Humboldt State University. He has participated in and managed fishery restoration and research projects in the Central Valley for five years. He has extensive experience relevant to the proposed project. He developed and implemented measures to improve fish passage on the Cosumnes River via the Cosumnes River Salmonid Passage Improvement Project and has developed methodologies to determine spatial and temporal densities and distribution of juvenile chinook salmon and steelhead within the Stanislaus River by direct observation. He has also contributed to the present understanding of how juvenile fish utilize floodplain habitats within the Cosumnes River and is currently working with the AFRP to determine habitat preferences, residence time, and the degree of stranding of juvenile chinook salmon within the Cosumnes River Preserve.

Stillwater Sciences

Stillwater Sciences is a firm of biological and geological scientists. The company specializes in developing new scientific approaches and technologies for environmental problem-solving in aquatic and terrestrial systems and has extensive experience and in-house ability in GIS applications to environmental analyses. Its founding members are experienced in freshwater ecology, fisheries and wildlife biology, riparian and wetland ecology, entomology, botany, and hillslope and fluvial geomorphology. The company also has extensive experience in environmental compliance, planning, and management as well as state and federal permitting. Stillwater Sciences team members have conducted biological, geomorphic, hydraulic, and hydrologic analyses on the Merced, Tuolumne, and Stanislaus Rivers. Recent local projects include the biological resources assessment for CEQA/NEPA analyses and permitting for a restoration project extending more than seven miles on the Tuolumne River (with EDAW, for the Turlock Irrigation District), ongoing and project-specific monitoring efforts associated with restoration and adaptive management of Tuolumne River aquatic and riparian habitat (for the Turlock and Modesto Imgation Districts), and the Tuolumne River Salmon Enhancement Project (Stillwater Sciences staff while working for EA, for the Turlock and Modesto Irrigation Districts). Other recent projects include development of a multi-species habitat conservation plan for the Jackson Demonstration Forest (for the California Department of Forestry and Fire Protection), and the North Umpqua Watershed Analysis (for PacifiCorp).

Stillwater Sciences **Staff**

Frank Ligon is an aquatic ecologist and geomorphologist specializing in investigations of the role of fluvial processes in the ecology of stream fish, invertebrates, and plant communities. He has successfully managed several complex, long-term projects, including projects involving watershed analysis, salmon ecology and restoration, geomorphology and riverine ecosystem restoration. On the Tuolumne River, Mr. Ligon managed

fisheries studies for the Turlock and Modesto Imgation Districts from 1987 to 1996 and continues working for the Districts on Tuolumne River and Central Valley fisheries issues.

Jennifer Vick is an Ecologist/Geomorphologist who has conducted geomorphic and hydrologic analyses on the Merced, Tuolumne, and Stanislaus rivers. Her recent work includes monitoring of large-scale aquatic and riparian habitat restoration projects, evaluation of chinook salmon survival and population dynamics, and assessment of chinook salmon habitat quality on the lower Tuolumne River in association with the Tuolumne River Technical Advisory Commission (TRTAC). She completed an extensive analysis of geomorphic trends in the Merced River, including assessment of the hydrologic and geomorphic impacts of dams and instream and floodplain gravel mining. Ms. Vick's work has involved extensive coordination with state and local agencies, Merced Irrigation District, and local landowners. Ms. Vick is also experienced in project planning and management and has worked on restoration plans for several California streams and rivers. She is currently project manager for the Merced River Corridor Restoration Plan.

Dirk Pedersen has over 9 years experience in studying aquatic ecology and stream channel relationships. Mr. Pedersen has particular expertise in aquatic ecology and fish habitat relationships, watershed analysis, fluvial geomorphology, aquatic entomology, and the effects of dams on aquatic and riparian ecosystems. His areas of technical expertise include salmonid ecology. Mr. Pedersen has many years experience in the development and implementation of watershed analysis techniques, and fluvial processes, and the effects of watershed-level disturbances on stream dynamics and aquatic habitat conditions

Dr. Yantao Cui is a civil engineer with over ten years of experience modeling sediment dynamics and hydraulic effects in regulated rivers. His applied research projects have involved investigation of riverbank erosion, effects of gravel extraction on fluvial geomorphic processes, and the downstream impacts of reservoir management.

E. Cost

1. Budget

Year	Task	Direct Labor Hours	Salary	Benefits	Travel	Supplies	Service Contract	Overhead (10%)	Total Cost
Year 1	1. Stakeholder Coordination	80	2360	600	345		16,044	1,975	21.723
	2. Quality Assurance Plan						10.173	1,017	11.191
	3. Reconnaissance Studies	30	1,035	225	488		46.883	5.083	55,694
	4. Fish Community Assessment	240	6.210	1,350	488		70.178	7.823	86,048
	5. Temperature Monitoring	40	1,380	300			4.142	562	6,405
	6. Barrier/ Entrainment-Point Evaluations						10,294	1,029	11,323
	7. Preliminary Population Modeling						11,530	1.153	12.688
Year 1 Total Cost		390	11,385	2,475	1,321		171,243	18,642	205,067
Year 2	8. Mechanisric Research	160	5.520	1,200	975		41.983	4.968	54.646
	9. Data Synthesis (Modeling)						20.887	2.067	22,954
	10. Define Restoration Goals and Objectives + final report						29,124	2.912	32,037
Year 2 Total cosl		160	5.520	1,200	975		91,975	9,967	109,637
Project Total Cost		550	16,905	3,675	2,296	-	263,218	28,609	314,704

2. Cost-Sharing

In 1999, the AFRP funded a study for $8,968.66 of spawning and incubation conditions in the Calaveras River in the 1.5-mile reach downstream of New Hogan Dam. In addition, the CRSC is currently seeking funding for a portion of the proposed study from the California Sportfishing Protection Alliance.

G. Local Involvement

Public and stakeholder support and participation are a key component of this project and are crucial for developing a implementable restoration actions. The Project Team is working closely with the Calaveras River Steering Committee and has coordinated with the Calaveras County Water District. The Project Team will continue to coordinate with the Calaveras County Water District and the Stockton East Water District throughout the study process.

H. Compliance with Standard Terms and Conditions

The Applicant has reviewed and is able to comply with the terms and conditions set forth in Attachment D and E of the Proposed Solicitation Package. Additional forms required for submittal with this proposal are attached.

I. Literature Cited

AFRP (Andromous Fish Restoration Program). 1995. Working paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 1. 9 May. Prepared for USFWS under the direction of the Anadromous Fish Restoration Program Core Group, Stockton, California.

CALFED Bay-Delta Program. 1997. Ecosystem restoration program plan. Volume II: Ecological zone visions. Review draft report. Sacramento, California.

CALFED Bay-Delta Program. 1997. Draft Programmatic Environmental Impact Statement/Environmental Impact Report for the CALFED Bay-Delta Program. Prepared by the CALFED Bay-Delta Program for the U. S. Bureau of Reclamation, U. S. Fish and Wildlife Service, National Marine Fisheries Service, U. S. Environmental Protection Agency, Natural Resources Conservation Service, U. S. Army Corps of Engineers, and the California Resources Agency.

CALFED Bay-Delta Program. 1999. Ecosystem restoration program. CD-ROM. CALFED Bay-Delta Program, Sacramento, California.

CDFG (California Department of Fish and Game). 1993. Draft. Stream comdor protection plan.

Christensen, N. L., A. M. Bartuska, J. H. Brown, S. Carpenter, C. D'Antonio, R. Francis, J. F. Franklin, J. A. MacMahon, R. F. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. G. Woodmansee. 1996. The report of the Ecological Society of America Committee on the scientific basis for ecosystem management. Ecological Applications 6: 665-691.

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Hunter, C. J. 1991. Better trout habitat: a guide to stream restoration and management. Island Press, Washington, D.C.

Lee, K. N. 1993. Compass and gyroscope: integrating science and politics for the environment. Island Press.

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Stillwater Sciences. 2000. Calaveras River Spawning Gravel Assessment. Technical Memorandum. Prepared for Erwin Van Nieuwenhuyse (USFWS-AFRP) and John Raine (New Hogan Lake Conservancy) by Stillwater Sciences, Berkeley, California.

USFWS (U. S. Fish and Wildlife Service). 1993. Memo to USBR regarding Stanislaus River basin—Calaveras River conjunctive use water program study: a preliminary evaluation of fish and wildlife impacts with emphasis on water needs of the Calaveras River. Washington D. C.

Walters, C. J. 1986. Adaptive management of renewable resources. McGraw-Hill.

Walters, C. 1997. Challenges in adaptive management of riparian and coastal ecosystems. Conservation Ecology (online) 1: 1 [Available from the Internet. URL: **http://www.consecol.org/voll/iss2/artl].**

Yoshiyama, R. M., E. R. Gerstung, F. W. Fisher, and P. B. Moyle. 1996. Historical and present distribution of chinook salmon in the Central Valley drainage of California. Pages 309-362 *in* Sierra Nevada Ecosystem Project: final report to congress. Volume 111: Assessments, commissioned reports, and background information, University of California, Center for Water and Wildland Resources, Davis.

Tuolumne Reports

Reports prepared in whole or in part by Frank Ligon while employed at EA Engineering and managing the Tuolumne River chinook salmon ecology and restoration project. All are appendices to: Don Pedro Project Fisheries Studies Report (FERC Article 39, Project No. 2299). *In* Report of Turlock Irrigation District and Modesto Irrigation District Pursuant to Article 39 of the License for the Don Pedro Project, No. 2299. EA, Lafayette, California.

Appendix 1: San Joaquin River system chinook salmon population model documentation and validation. 1991.
Appendix 2: Stock-recruitmentanalysis of the population dynamics of San Joaquin River system chinook salmon. 1992.
Appendix 3: Tuolumne River salmon spawning surveys 1971-1988. 1991.
Appendix 5: Analysis of 1981 lower Tuolumne River IFIM data. 1991.
Appendix 6: Lower Tuolumne River spawning gravel availability and superimposition. 1992.
Appendix 7: Lower Tuolumne River chinook salmon redd excavation report. 1991.
Appendix 8: Lower Tuolumne River spawning gravel studies report. 1991.
Appendix 9: Spawning gravel cleaning methodologies. 1991.
Appendix 10: 1987 Juvenile chinook salmon mark-recapture study. 1991.
Appendix 11: An evaluation of the effect of gravel ripping on redd distribution in the lower Tuolumne River. 1991.
Appendix 12: Data reports: seining ofjuvenile chinook salmon in the Tuolumne, San Joaquin, and Stanislausrivers, 1986-1989. 1991.
Appendix 13: Preliminary juvenile salmon study: Report on sampling of chinook salmon *fry* and smolts by fyke net and seine in the lower Tuolumne River 1973-1986. 1991.
Appendix 14: Tuolumne River fluctuation flow study report. 1991.
Appendix 15: Tuolumne River fluctuation flow study plan: Draft. 1992.
Appendix 16: Aquatic invertebrate studies report. 1991.
Appendix 17: Preliminary Tuolumne River water temperature report. 1991.
Appendix 18: Lower Tuolumne River instream temperature model documentation: Description and calibration. 1991.
Appendix 19: Modeled effects of La Grange releases on instream temperatures in the lower Tuolumne River. 1991.
Appendix 20: Juvenile salmon pilot temperature observation experiments. 1991.
Appendix 21: Possible effects of high water temperature on migrating chinook salmon (*Oncorhynchus tshawytscha*) smolts in the San Joaquin River. 1991.
Appendix 22: Lower Tuolumne River predation study report. 1992.
Appendix 23: Effects **of** turbidity on bass predation efficiency. 1991.
Appendix 24: Effects of introduced species of fish in the San Joaquin River system. 1991.
Appendix 26: Export mortality fraction submodel. 1992.
Appendix 27: Tuolumne River summer flow study report 1988-1990. 1991.
Appendix 28: Tuolumne River summer flow invertebrate study. 1991.

J. Threshold Requirements

APPENDIX A: Factors Potentially Limiting Population Abundance

QAPP agency review

1. Adult upstream migration
- Calaveras River attraction flows
- Physical migration barriers (e.g., dams, dewatered reaches, inadequate flows)
- Environmental migration barriers (e.g., water quality, water temperature)
- Migration comdor hazards (e.g., unscreened diversions, bypasses, poaching)

2. Spawning and incubation
- Spawning gravel quantity and redd superimposition
- Spawning gravel quality (e.g., intergravel **flow,** sedimentation, armoring)
- Water quality and temperature
- Substrate mobility/scouring
- Redd dewatering

3. Early rearing
- Availability of suitable stream margin habitat for fry rearing
- Proximity of fry rearing habitat to spawning areas
- Water quality (e.g., temperature, toxics)
- Predation
- Food availability
- Stranding by low flows
- Displacement by high flows

4. Juvenile rearing
- Availability of oversummering habitat (e.g., Deep pools, temperature refugia)
- Availability of overwintering habitat (e.g., In-channel LWD, interstitial habitat)
- Stranding by low flows
- Displacement by high flows
- Predation
- Food availability
- Interspecific interactions between native species
- competition with introduced species

5. Outmigration
- Adequate flows for outmigration
- Water quality and temperature
- Predation

FISHERY FOUNDATION OF CALIFORNIA

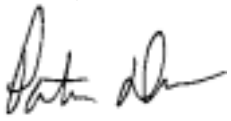
P.O. Box271114 / Concord, CA 94527-1114 / (925)944-9115 / FAX (925) 944-3514

Calaveras County Water District
Simon Granville
PO **Box** 846
San Andreas CA **95249**

May 13,2000

Dear Mr. Granville,
Please find enclosed a CALFED proposal to conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,



Patricia Duran
Executive Director

FISHERY FOUNDATION OF CALIFORNIA

P.O. Box271114 / Concord, CA 94527-1114 / (925)944-9115 / FAX (925) 944-3514

Stockton East Water District
Kevin Kaufman
P.O. Box 5157, East Main St.
Stockton CA 95205
FAX 209.948.0423

May 13,2000

Dear Mr. Kaufman,
Please find enclosed a CALFED proposal to conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,

Patricia Duran
Executive Director

FISHERY FOUNDATION OF CALIFORNIA

*P.O. **Box** 271114 / Concord, CA 94527-1114 / (925)944-9115 / FAX (925)944-3514*

Calaveras County Board of Supervisors
Tom Tryon
Government Center
San Andreas CA 95249

May 13,2000

Dear Mr. Tryon,
Please find enclosed a CALFED proposal to conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,

Patricia Duran
Executive Director

FISHERY FOUNDATION OF CALIFORNIA

P.O. Box271114 / Concord, *CA 94527-1114* / (925)944-9115 / *FAX (925) 944-3514*

San Joaquin County Board of Supervisors
Board of Supervisors Clerk
222 East Webster **Av,** Room 701
Stockton CA 95202

May 13,2000

Dear Board of Supervisors Clerk,
Please find enclosed a CALFED proposal to conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,

Patricia Duran
Executive Director

FISHERY FOUNDATION OF CALIFORNIA

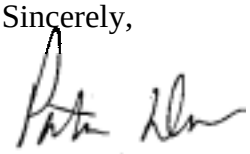
P.O. Box271114 / Concord, CA 94527-1114 / (925)944-9115 / FAX (925) 944,3514

Delta Protection Commission
14215 River Road
P.O. **Box** 530
Walnut Grove CA 95690
916.776.2290

May 13,2000

Dear Sir or Madam,
Please find enclosed a CALFED proposal **to** conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to'identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,



Patricia Duran
Executive Director

FISHERY FOUNDATION OF CALIFORNIA

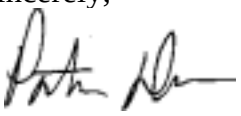
P.O.Box271114 / Concord, CA 94527-1114 / (925)944-9115 / FAX (925) 944-3514

Bay Conservation and Development Commision
30 Van Ness Avenue, Room 2011
San Francisco CA 94102
415.557.3686

May 13,2000

Dear Sir or Madam,
Please find enclosed a CALFED proposal to conduct a preliminary assessment of the Calaveras River ecosystem. The purpose of this study is to identify factors that might be limiting to chinook salmon and steelhead populations in the system and generate an informed process of increasing those populations.

Sincerely,



Patricia Duran
Executive Director

Environmental Compliance Checklist

1. Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), **or** both?

   ___ Yes X No

2. **If** you answered yes to **#1,** identify the lead governmental agency **for** CEQA/NEPA compliance.

   N/A
   Lead Agency

3. If you answered no to **#1,** explain why CEQA/NEPA compliance is not required for the actions in the proposals.

   The proposed project is research only and thus does not constitute an action that will require CEQA/NEPA compliance.

4. **If** NEPA/CEQA compliance is required, describe how the project will comply with either **or** both **of** these laws. Describe where the project is in the compliance process and the expected date **of** completion.

   Does not apply to proposed project.

5. Will the applicant require access across public **or** private property that the applicant does not own to accomplish the activities in the proposal?

   X Yes ___ No

   Some access to private property will be required. Issues of access are addressed through active involvement with the Calaveras River Steering Committee and the use of a study design that permits flexibility in site selection. If project is funded, land use agreements will **be** obtained within 30 days.

6. Please indicate what permits **or** other approvals may he required for the activities contained in your proposal. Check all boxes that apply.

Conditional use permit	___
Variance	___
Subdivision Map Act Approval	___
Grading permit	___
General plan amendment	___
Specific plan approval	___
Rezone	___
Williamson Act Contract cancellation	___
Other_____ (please specify)	___
None required	X

STATE

CESA Compliance	___ (DFG)
Streambed Alteration Permit	___ (DFG)
CWA &401 certification	___ (RWQCB)
Coastal development permit	___ (Coastal Commission/BCDC
Reclamation Board Approval	___
Notification	___ (DPC, BCDC)
Other ___CDFG___ (please specify)	__X
None required	___

FEDERAL

ESA Consultation	___ (USFWS)
Rivers and Harbors Act permit	___ (ACOE)
CWA & 404 permit	___ (ACOE)
Other _____ (please specify)	___
None required	X

Land Use Checklist

1. **Do** the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easements **or** placing **of** land in a wildlife refuge)?

   ___ Yes X No

2. If NO to #1, explain what types **of** actions are involved in the proposal (i.e. research or planning)
   Proposed project is research only.

3. **If** yes to #1, what is the proposed land use change **or** restriction under the proposal?
   Not applicable to proposed project.

4. If YES to #1, is the land currently under a Williamson Act contract
   Not applicable to proposed project.

5. If YES to #1, answer the following:
   Current land use — Not amlicable to proposed moiect.
   Current Zoning — Not applicable to proposed project.
   Current general plan designation — Not applicable to proposed oroiect.

6. **If** YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance **or** Unique Farmland on the Department of Conservation Important Farmland Maps?
   Not applicable to proposed project.

7. **If** YES to #1, how many acres **of** land will be subject to physical change **or** land use restrictions under the proposal?
   Not applicable to proposed project.

8. **If** YES to #1 is the property currently being commercially farmed **or** grazed?
   Not applicable to proposed project.

9. **If** YES to #8, what are the number of employees/acre Not applicable
   the total number of employees Not applicable

10. Will the applicant acquire any interest in land under the proposal (fee title **or** a conservation easement)?

    ___ Yes X No

11. What entitylorganization will hold the interest? Not amlicable to proposed Droiect.

12. **If** YES to #10, answer the following:

    Total number of acres to be acquired under proposal — Not amlicable to proposed project.
    Number **of** acres to be acquired in fee — Not applicable to proposed Droiect.
    Number of acres to be subject to conservation easement — Not applicable to proposed Droiect.

13. **For** all proposals involving physical changes to the land **or** restriction in land use, describe what entity or organization will:
    manage the property — Not amlicable to proposed moiect.
    provide operations and maintenance services — Not amlicable to proposed oroiect.
    conduct monitoring — Not amlicable to proposed project.

14. **For land acquisitions (fee title or easements), will existing water rights also he acquired?**
Not applicable to proposed project.

15. **Does the applicant propose any modifications to the water right or change in the delivery of Water?**

____	X
Yes	**No**

16. **If YES to #15, describe** Not applicable to proposed project.

STATE OF CALIFORNIA

NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV 3-95)

COMPANY NAME: FISHERY FOUNDATION OF CALIFORNIA

The company named above (herinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), medical condition (cancer), age (over 40), marital status, denial of family care leave and denial of pregnancy disability leave.

CERTIFICATION

*I, **the official named below, hereby swear that** I **am duly authorized to legally bind the prospective contractor** to **the above described certification.** I **am fully aware that this certification, executed** on **the date and in the county below, is made under penalty** of **perjury under the** laws **of the State of California.***

OFFICIAL'S NAME: PATRICIA DURAN

DATE EXECUTED: 5-17-00

EXECUTED IN THE COUNTY OF: CONTRA COSTA

PROSPECTIVE CONTRACTOR'S SIGNATURE:

PROSPECTIVE CONTRACTOR'S TITLE: EXECUTIVE DIRECTOR

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME: FISHERY FOUNDATION OF CALIFORNIA

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. **0348-0043**

2. DATE SUBMITTED	Applicant Identifier
5/15/00	

1. TYPE OF SUBMISSION:

- Application: ☐ Construction ☒ Non-Construction
- Preapplication: ☐ Construction ☐ Nan-Construction

3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECENED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name: Patricia Duran

Organizational Unit: Fshear Foundation of California

Address (give *city*, county, State, and zip *code):* P.O. Box 271114, Concord, CA 94527-1114

[Name and telephone number of person to be contacted on matters involving this application *(give area code)*: Patricia Duran (925)944-9115

6. EMPLOYER IDENTIFICATION NUMBER *(EIN):* 94 – 2987019

7. TYPE OF APPLICANT (enter appropriate *letter in box)* ☐

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) non-profit

8. TYPE OF APPLICATION:

☒ New ☐ Continuation ☐ Revision

if Revision, enter appropriate letter(s) in box(es) ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other *(specify):*

9. NAME OF FEDERAL AGENCY: CALFED

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: ☐☐ – ☐☐☐

TITLE:

11. DESCRIPTIVE TITLE OF APPLICANTS PROJECT: Lower Calaveras River chinook salmon and steelhead life history limiting factors assessment.

12. AREAS AFFECTED BY PROJECT *(Cities,* Counties. States. *etc.):* Calaveras and San Joaquin Counties, California

13. PROPOSED PROJECT		14. CONGRESSIONAL DISTRICTS OF:	
Start Date: 2000	Ending Date: 2002	a. Applicant: 10	b. Project: 4, 11

15. ESTIMATED FUNDING

a. Federal	$ 205,067.00
b. Applicant	$ .00
c. State	$ .00
d. Local	$ .00
e. Other	$ .00
f. Program Income	
g. TOTAL	$ 205,067.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER **12372** PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER **12372** PROCESS FOR REVIEW ON:

DATE _____

b. No. ☐ PROGRAM **IS** NOT COVERED BY E. **0.12372**
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BEUEF, ALL DATA IN THIS **APPLICATIDNIPREAPPLICATION** ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE **IS** AWARDED.

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
Patricia Duran	Executive Director	(925)944-9115
d. Signature of Authorized Representative: Patricia Duran		e. Date Signed: May 14 2000

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BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program or Activity	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (C)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1.		$	$	$ 314,704	$	$
2.						
3.						
4.						
5. Totals		$	$	$ 314,704	$	$

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
a. Personnel	$ 16,905	$	$	$	$ 16,905
b. Fringe Benefits	3,675				3,675
c. Travel	2,296				2,296
d. Equipment					
e. Supplies					
f. Contractual	263,219				263,219
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)	286,095				286,095
j. Indirect Charges	28,609				28,609
k. TOTALS (sum of 6i and 6j)	$ 314,704	$	$	$	$ 314,704
7. Program Income	$	$	$	$	$

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